International Workshop on Managing Knowledge for Space Missions

KNOWLEDGE MANAGEMENT ACTIVITY IN THE SATELLITE DOMAIN IN JAXA (CKHP2)

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Outline

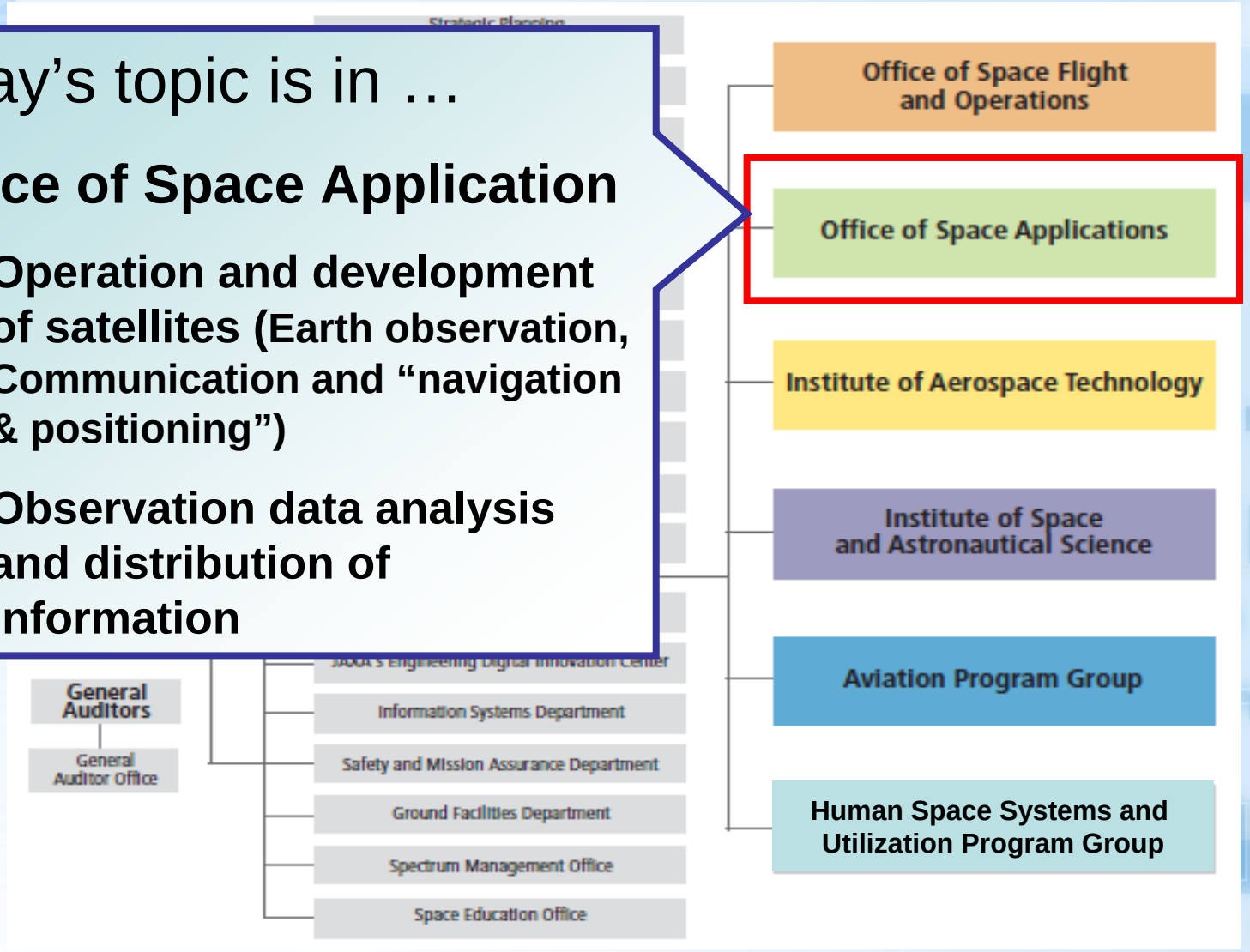
1. JAXA Organization
2. Our goal on Knowledge Management (KM)
3. Issues on KM
4. Activities for the issues
5. Result of activities
6. Future work

1. Our Organization

JAXA: Japan Aerospace eXploration Agency

Today's topic is in …

- **Office of Space Application**
  - **Operation and development of satellites (Earth observation, Communication and "navigation & positioning")**
  - **Observation data analysis and distribution of information**

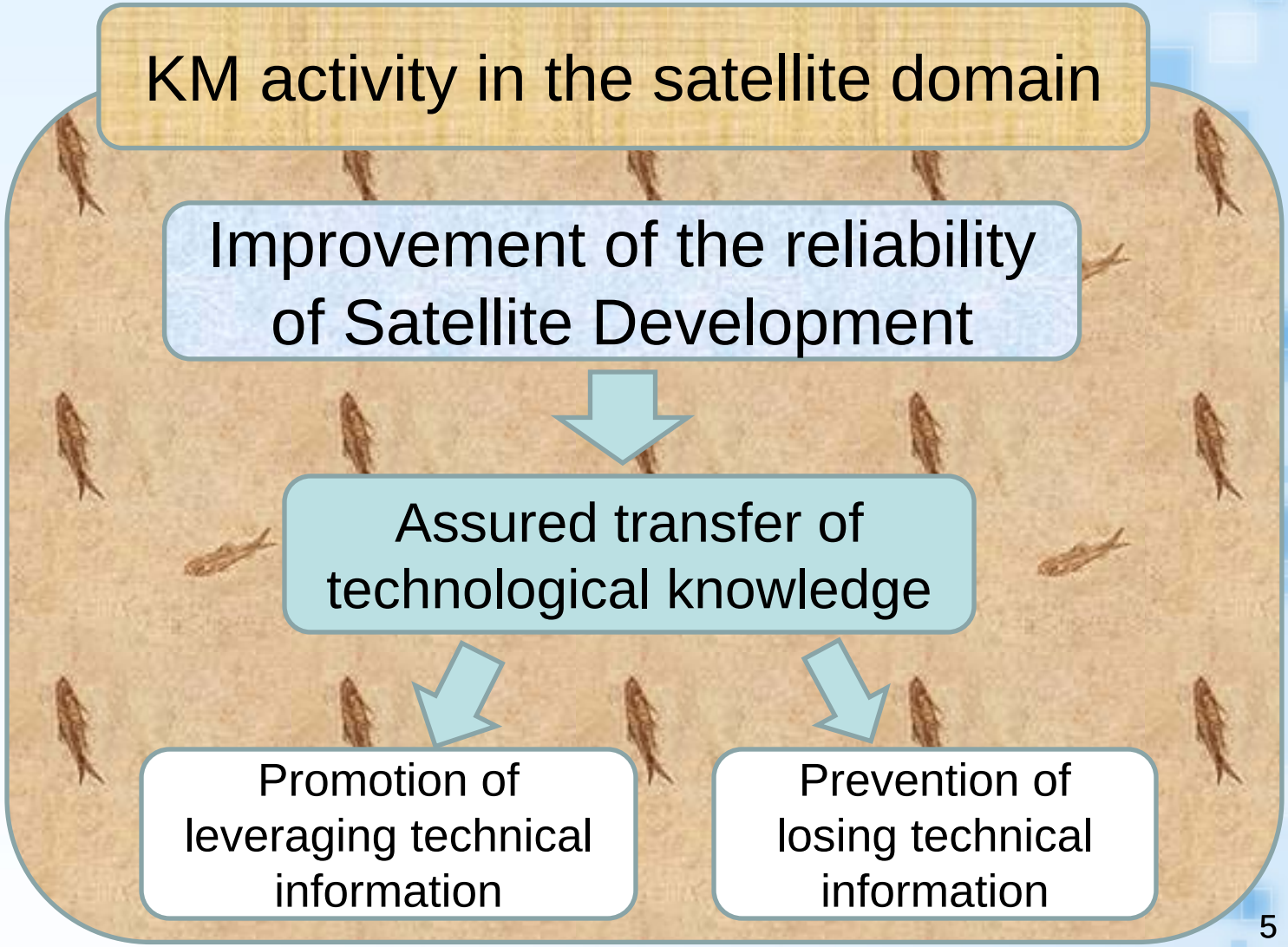


1. Our Organization

2.Our goal on KM

3. Issues on KM
4. Activity for the issues
5. Result of activity:
6. Future work

2. Our Goal on KM



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3-1. Background

In 2004,
We found it

- A Culture which each satellite project had individual method of project management
- A lot of unclassified technical documents of a terminated project

start

Investigation for understanding current situation

3-2. Issues on KM(1/2)

- Inadequate Sharing knowledge with Other projects (issue #1)
  - Impossibility to know even the existence of the information
    - Until asking the project member directly

Reason

  - Sharing information by Only Face-to-Face Communication

Reason

  - Concern about incorrect transfer
    - Not finalized information
    - Proprietary information

3-3. Issues on KM(2/2)

- Losing knowledge of Terminated Projects (issue #2)
  - Project = Temporary team
  - Termination without classification of their technical documents
    - Important information might be disposed
    - Unimportant information might be left

Reason

  - No standard rule of storage
  - No destination of storage

Terminated projects' information

1. Our Organization
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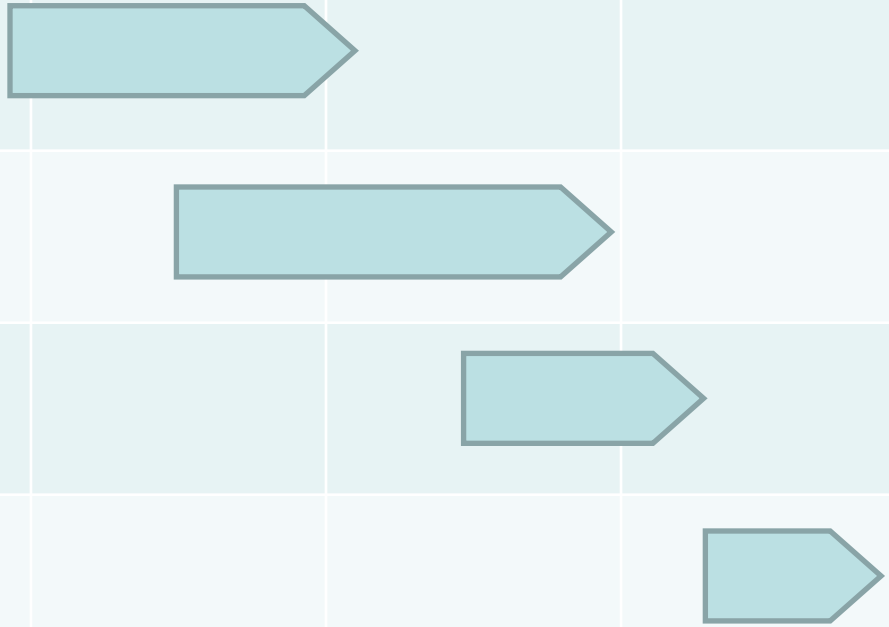
4-1. Activities for the issues

- In order to solve those issues, we started our KM activities.

	2004	2005	2006	2007
Basic policy				
Standard rule				
Develop tools				
Apply rule and tools				



4-2. Scope as a first step

- Technical information of satellite projects
  - Technical Documents
    - Specification
    - Requirement
    - Design
    - ...
  - Technical Data
    - Analysis data
    - Test data
    - CAD data, …

Target in this time

4-3. Basic policy

- For leverage
  - To share the existence of technical information at least
    - Compromise between “sharing” and “protecting”
  - To use standard category among projects
  - Responsibility to leverage-> User
- For storage
  - Assured transfer at the termination
  - Computerization of documents

4-4. Standard rule

- Purpose of the Standard rule
  - Indicating specific process on the basic policy to project members

Discussion with project members

- The important discussion points
  - What and when do you use technical documents?
  - What is easier and more intuitive categorization to find the documents?

Result of discussion

Definition of Contents with Priority & Categorization

4-5. Contents with Priority and Categorization

Example

Category	Contents	Priority[a]
Engineering specification (ESPC)	System ESPC Sub system ESPC Interface Control Specification ...	* * *
Design report (Review Board)	preliminary design Document Detailed design… …	* *
...	...	…
Meeting materials	…	
Technical letter	...	
		…

[a] The documents with asterisk '*' are high priority documents

- We can understand
  - What are technical documents?
  - Which is more important document?
  - How should I categorize documents?
  - Which is right category to find a document?

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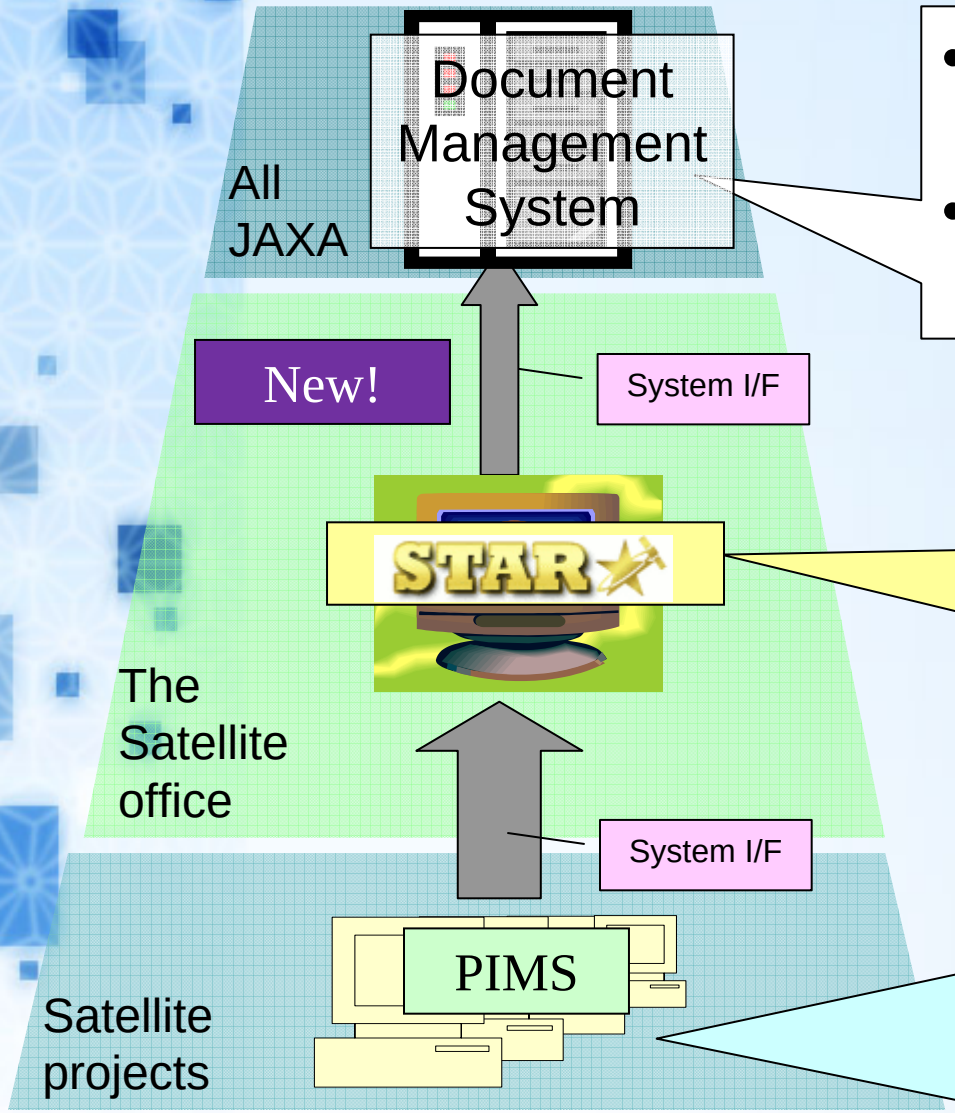
4-6. Other points of Standard rule

- Specific methods: how to …
  - Prepare for the document management when a project starts-up
  - Leave the rationale of information on the technical documents
  - Computerize documents
  - Leverage information with responsibility
  - Transfer assuredly to other departments when a project is terminated

4-7. Tools (whole architecture)



- **Document management system for ALL JAXA.**
- **Different security policy from the satellite office**

- **Satellite Technical information ARchive system (STAR)**

- **Project Information Management System (PIMS) operated by each project**
- **Sharing information inside a project**

4-8. Tools (STAR)

- Three retrieval functions

Matrix Search

Tree Search

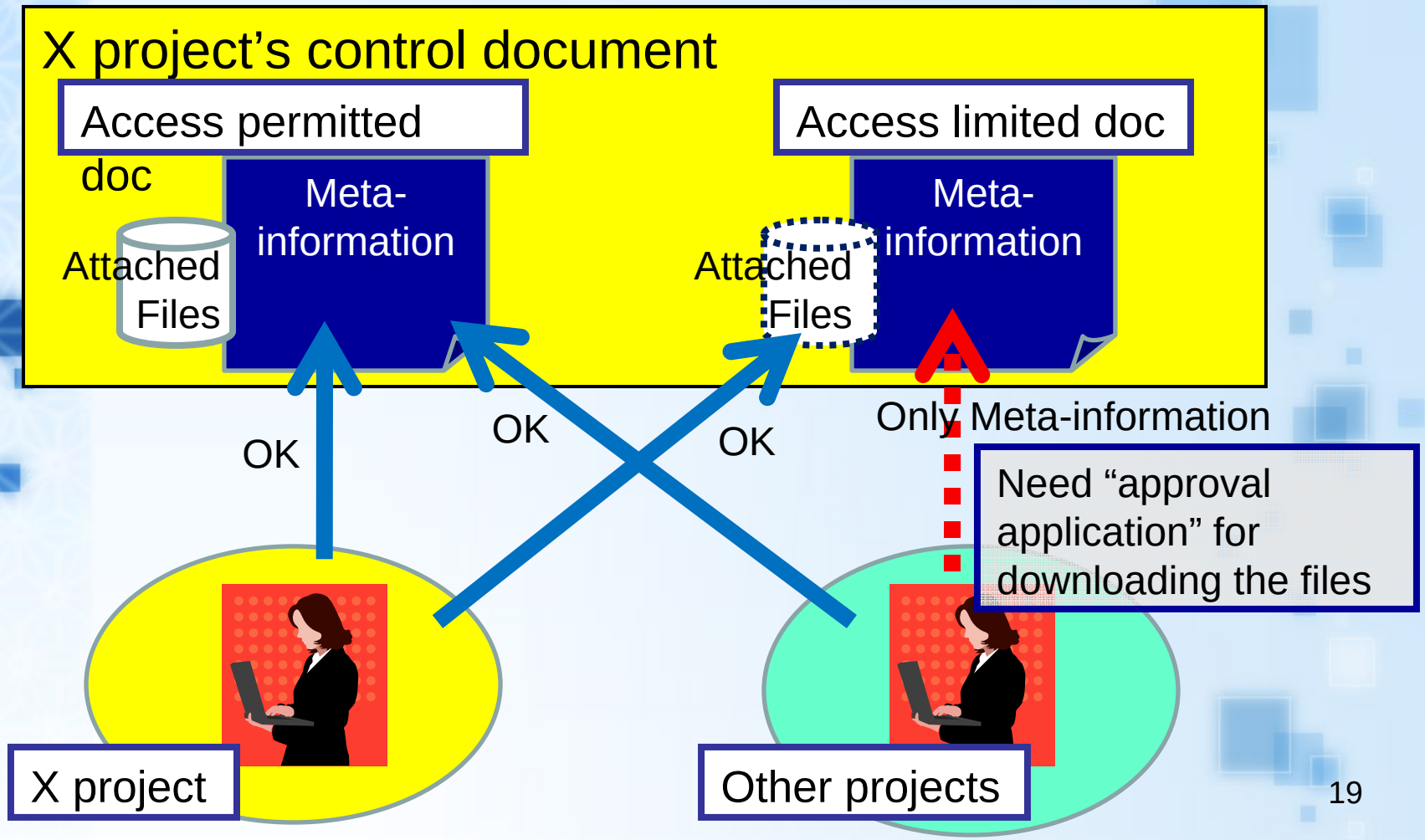
Meta Search

Row: Std category

Column: Satellite

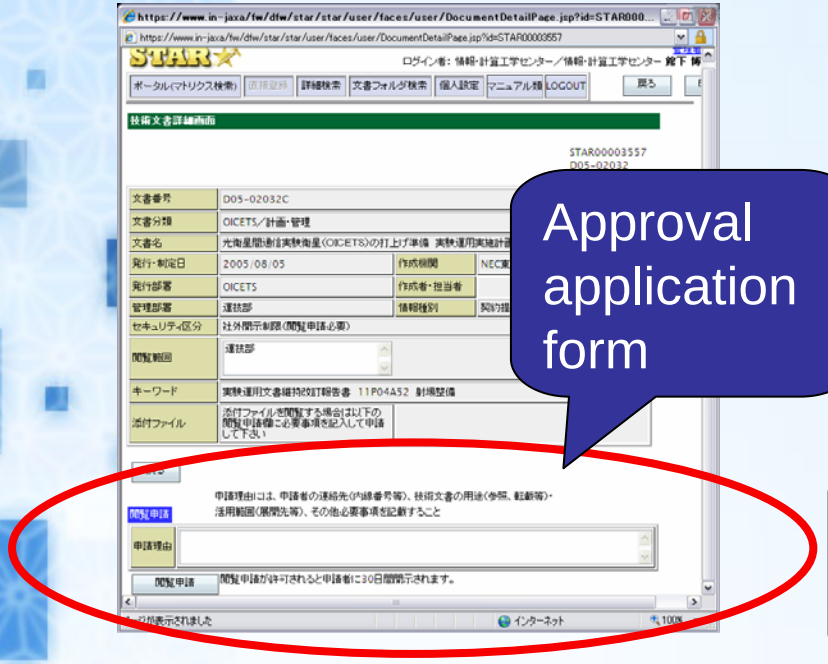
4-9. Tool (STAR)

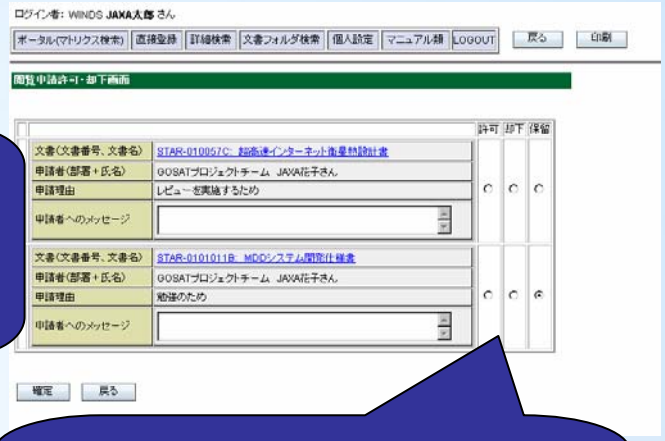
- Function for proper access control



4-10. Tool (STAR)

- Function for approval application for downloading attached files





- Prevention of “incorrect transfer of information”

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5-1. Result (standard rule)

- Smooth termination of two projects (OICETS*1 in April, ALOS*2 in May)
  - Transfer important documents to other department
  - Disposal of unimportant documents

Prevention of losing technical documents of terminated projects → improve → Losing of technical knowledge (Issue #2)

- Application the Standard categorization to projects

Easy retrieval by using standard category → improve → Inadequate sharing information (Issue #1)

*1: OICETS (**Optical Inter-orbit Communications Engineering Test Satellite)**

*2: ALOS (**Advanced Land Observing Satellite)**

5-2. Result (Tools: STAR)

- The Information Stream (PIMS -> STAR) started in May 2007
  - Technical documents in PIMS are being stored to STAR gradually

Promote sharing by not only face-to-face but also IT tools → improve → Inadequate sharing information (Issue #1)

  - All of important technical documents in PIMS will be transferred to STAR before the termination of the project

Prevent losing PIMS contents of terminated Projects → improve → Losing of technical knowledge (Issue #2)

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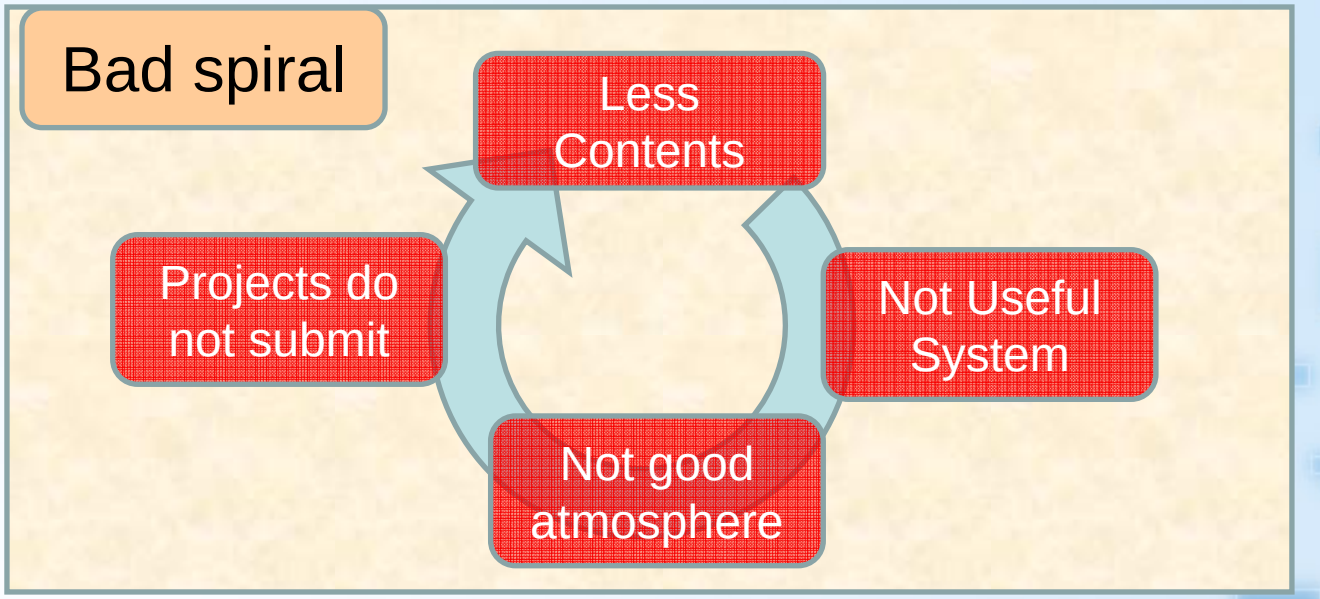
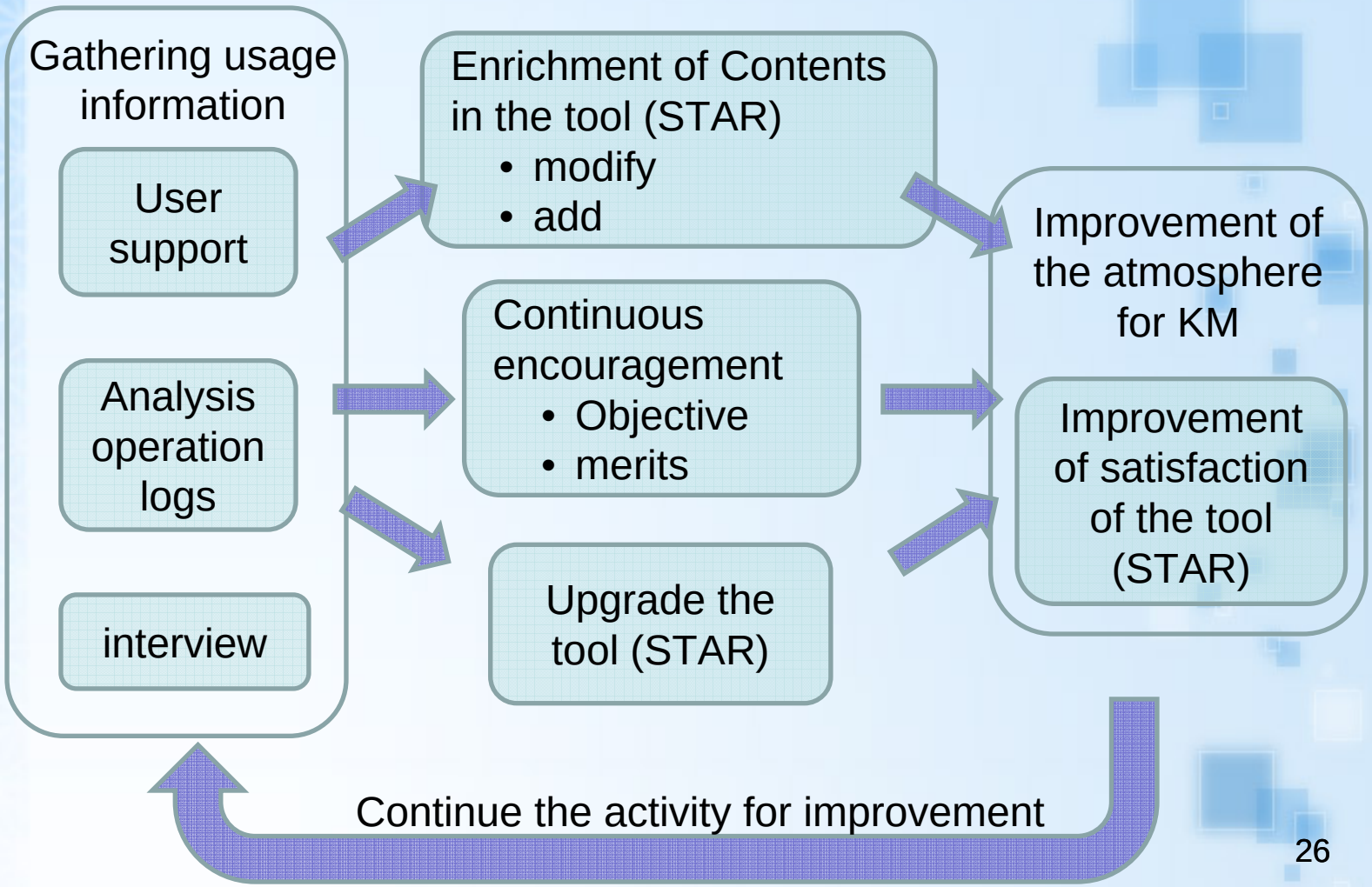
6-1. Remaining Issues

- Less usage of STAR than predicted
- More access limited documents than predicted



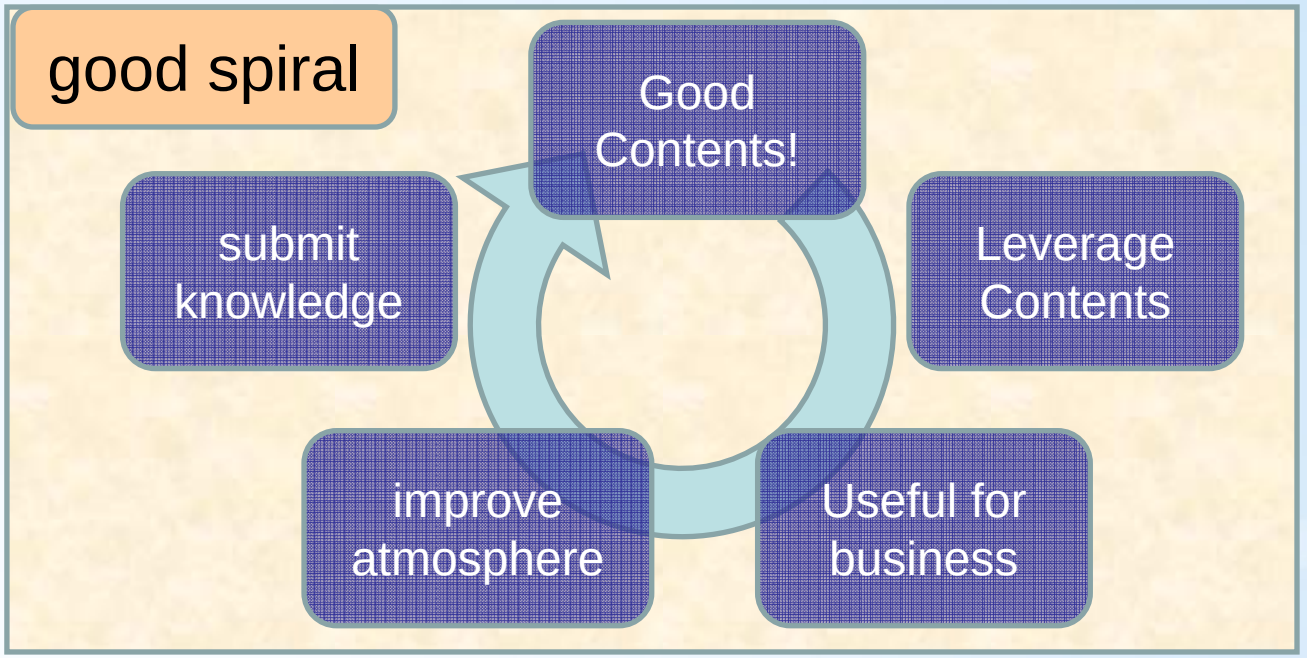
6-2. Future work (1/2)

- Promotion of the using the tool (STAR)



6- 3 . Future work (2/2)

- Change the situation to the “good spiral” of information leveraging



Conclusion

- Issues on KM
  - Inadequate Information sharing
  - The risk of Losing knowledge
- Activities for the issues
  - Basic Policy & Standard rule
  - Information sharing tool (STAR)
- Result of Activities
  - Improve capture & storage
- Future work
  - Less usage of the tool

  - Change to the good spiral of information leveraging

Thank you!

For more information

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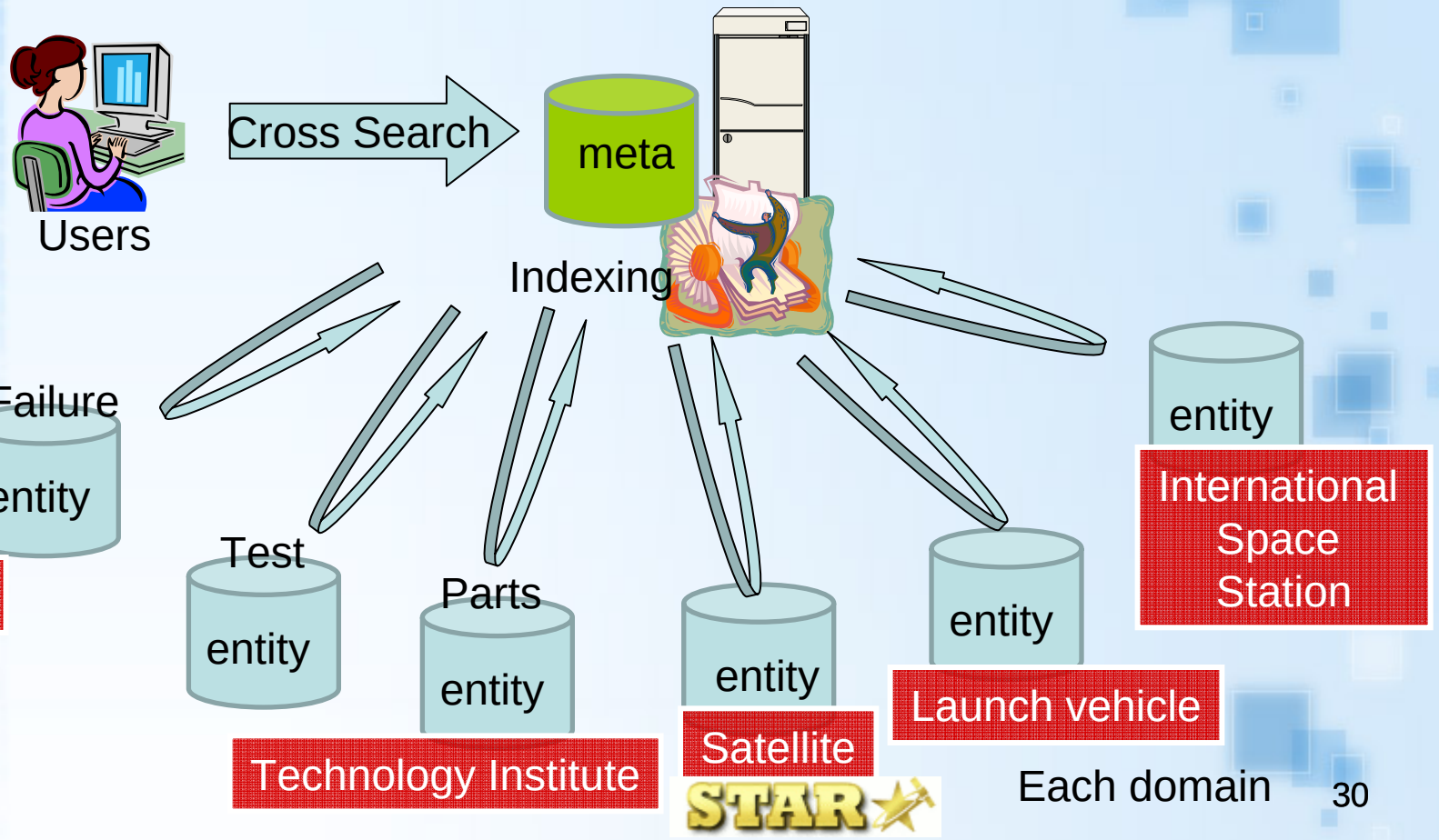
Future work (long-term)2/2

- Optimize System architecture



Standard category

category
Planning & Management
Progress Management
Engineering Specification
Review Board
Evaluation
Design Baseline
Analysis
Manufacture
Test
Launch
Tracking And Control
Operation
Frequency
Safety and Mission Assurance
contract
delivery
publication
Technical letter
Meeting materials
Etc.

details

Mission Definition Review
System Requirement Review
System Definition Review
Project Readiness Review
Preliminary Desing Review
Critical Desing Review
Post Qualification test Review
Pre-Shipment Review
定常運用移行審査
定常運用終了審査
ミッション終了審査
Safety Review

* This information will be Kept maintenance